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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,856	06/07/2005	Roland Anthony Tacke	1304.066USU	1935

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EXAMINER

VERDERAME, ANNA L

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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03/10/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/532,856	Applicant(s) TACKEN ET AL.	
	Examiner ANNA L. VERDERAME	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7-9,12-14,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7-9,12-14,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on 12/02/2009 has been entered.

Claim Objections

2. Claims 1 and 5 are objected to because of the following informalities: "crosslinking" should be changed to cross-linking and "subphotoresist" should be changed to sub-photoresist. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1,3,5, 7, 12-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. JP-10-031848(English translation provided).

Kondo et al. discloses a method for forming a master disc wherein a glass substrate is provided with a HMDS adhesive layer by placing the disk into a saturated vapor of HMDS for 3 min. Next, a photoresist layer having a thickness of 70 nm is formed on the HMDS layer. The photoresist was then baked. Next a pattern is formed and developed with a sodium hydrogen phosphate solution(an alkaline solution). A laser having a wavelength of 413 was used(0014-15). A disc having reduced jitter and decreased peeling(0023).

It is the position of the examiner that a relatively thick HMDS film is formed by letting the glass disc sit in a saturated vapor of HMDS for 3 min and that consequently a cross-linking reaction occurs between the subsequently applied photoresist layer after the layer is applied. This cross-linking reaction leads to the formation of a first sub-photoresist layer. Further no rinsing is performed by Kondo. Applicant states that by not performing rinsing a relatively thick adhesive layer having a thickness of 30 to 40 nm is formed. Thus the position of the examiner is supported because no rinsing step is performed by Kondo after application of HMDS in a saturated atmosphere for 3 minutes and thus a relatively thick HMDS layer must be formed.

By amendment applicant has limited their invention to that described at (0015) of their specification which is the only embodiment involving a single photoresist and a single adhesive layer. Examiner notes that applicant describes no preferable type of photoresist to be used and only states that the photoresist layer must be sensitive to light having a wavelength of 200-500nm for exposure purposes and subsequently soluble in an alkaline solvent.

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Applicant states that upon placing the photoresist layer onto an adhesive layer a chemical cross-linking reaction as a result of the adhesive molecules diffusing into the photoresist layer. Applicant has only stated that the adhesive layer is HMDS and or TMSDEA. No description of the formation of the layer is described in the specification.

5. Claim 1, 3, 5, 7, 12-14 and 17-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Hendriks et al. WO 02/09103 in view of Kondo et al. JP-10-031848(English translation provided)..

Hendriks et al. discloses a mastering process which discloses all of the limitations of the instant claims including the provision of an adhesion layer between the substrate and the photoresist layer.

Hendriks discloses that it is desirable to subject the substrate to a preparation step prior to carrying out step a), which comprises the cleaning of the substrate and possibly the application of an adhesion layer for the cross-linkable composition that is applied in step a). The adhesion layer, on account of its thickness can only be considered a "monolayer"(page 2 line 20).

Hendriks does not disclose that the adhesive is HMDS or TMSDEA or that the layer is 30nm to 40 nm thick/relatively thick. Examiner points out that the monolayer taught by Hendriks is not a 1nm thick layer but is a 1 molecule thick layer where the thickness is about equal to the diameter of the molecule.(emphasis added).

Kondo et al. discloses a method for forming a master disc wherein a glass substrate is provided with a HMDS adhesive layer by placing the disk into a

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saturated vapor of HMDS for 3 min. Next, a photoresist layer having a thickness of 70 nm is formed on the HMDS layer. The photoresist was then baked. Next a pattern is formed and developed with a sodium hydrogen phosphate solution(an alkaline solution). A laser having a wavelength of 413 was used(0014-15). A disc having reduced jitter and decreased peeling(0023).

It is the position of the examiner that a relatively thick HMDS film is formed by letting the glass disc sit in a saturated vapor of HMDS for 3 min and that consequently a cross-linking reaction occurs between the subsequently applied photoresist layer after the layer is applied. This cross-linking reaction leads to the formation of a first sub-photoresist layer. Further no rinsing is performed by Kondo. Applicant states that by not performing rinsing a relatively thick adhesive layer having a thickness of 30 to 40 nm is formed. Thus the position of the examiner is supported because no rinsing step is performed by Kondo after application of HMDS in a saturated atmosphere for 3 minutes and thus a relatively thick HMDS layer must be formed.

It would have been obvious to one of ordinary skill in the art to modify the disclosure of Hendriks et al. by forming an adhesive layer of HMDS by setting a glass substrate in a saturated vapor of HMDS for three minutes and subsequently coating the photoresist layer based on the example of Kondo and with a reasonable expectation of success based on the similarities between the methods of the two references and with a reasonable expectation of achieving the benefits recited in Kondo including forming a disc with reduced jitter and reduced photoresist peeling.

6. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over of Kondo et al. JP-10-031848(English translation provided) as applied above and further in view of Peterson et al. US 5,702,767 and

Kondo et al. does not disclose the limitations of claims 8-9. Kondo discloses the application of HMDS for 3 min in a saturated vapor and does not disclose a rinsing step.

Thompson teaches an example in which HMDS is coated on glass slides(10/50-60). The method usually comprises formation of a primer on a cleaned substrate of silicon, nickel, etc. Thompson teaches washing the surface with an effective amount of the priming composition. Further, Thompson teaches optionally rinsing the surface of the substrate with an aqueous solution(water) sufficient to remove contaminants and leave a thin film of priming composition on the cleaned surface. A photoresist is then formed on the priming composition layer(3/12-30).

Formation of an HMDS adhesive layer is clearly articulated by Hendriks et al. Further, rinsing to remove contaminants immediately after application of the adhesive layer is articulated by Thompson. The rinsing time needed to achieve the desired thickness depends upon the thickness of the originally applied adhesive layer. If a thick adhesive layer is applied a longer rinsing time can be employed. If a thinner layer is applied a shorter rinsing time is necessary. Also, there is a minimum amount of rinsing time necessary to achieve any sort of result including removal of contaminants.

Therefore, it would have been obvious to one of ordinary skill in the art to optimize the rinsing time in order to achieve the desired adhesive monolayer.

The experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in absence of unexpected results. In re Aller, 105 USPQ 233. One of ordinary skill in the art would have been motivated to adjust the rinsing time in order to achieve the desired adhesive monolayer. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective (longer rinsing times lead to the removal of more material), are unexpectedly good. In re Boesch and Slaney, 205 USPQ 215.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process Kondo et al. by applying an effective amount of HMDS and rinsing the HMDS layer immediately after application in order to remove contaminants and rinsing for a shorter time in order to maintain the thickness of the layer based on the teachings of Thompson, and with the reasonable expectation of forming an adhesive monolayer which is free of contaminants while still having the desired thickness.

Conclusion

Applicant has amended claims so that they read only on the embodiment taught at (0015) of the applicant's specification. Therefore, all previous rejections have been withdrawn. Applicant's arguments pertaining to these old rejections are therefore moot.

In the newly applied rejection a thick adhesive layer (formed by setting a glass substrate in a saturated vapor of HMDS for 3 min) formed without a rinsing step is taught by Kondo. Applicant states that a thick photoresist layer having a thickness of 30 to 40 nm is formed by applying the photoresist without rinsing at (0015). A photoresist layer is formed in contact with this layer and the laminate is baked. The chemical cross-linking reaction cited by applicant inherently takes place as a result of the contact between the HMDS and the photoresist layer (no specific photoresist materials are recited in applicant's specification) forming a first sub-photoresist layer the second sub-photoresist layer being made of the uncross-linked portions of the photoresist layer. By this cross-linking reaction, caused by contact of the adhesive and photoresist layer and subsequent diffusion of some adhesive molecules into the photoresist layer at the surface, a gradient is formed.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-US 5,702,767- Peterson teaches a method for providing an inorganic substrate having improved adherence for polymeric films (abstract). In examples 1-3 Peterson applies HMDS to a silicon wafer (11/35-55). Practical application of

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the invention is disclosed at (11/15-33). Suitable substrates are taught at (8/19-33). Disclosure of TMSDEA and HMDS as priming agents is found at (2/59-63).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached at (571)272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Anna L Verderame/
Examiner, Art Unit 1795

/Cynthia H Kelly/
Supervisory Patent Examiner, Art Unit 1795